REMARKS

In view of the preceding amendments and following remarks, reconsideration of the present application is respectfully requested.

Claims 1-12 were pending in the Application and were rejected. By this Response, Claims 1, 4, and 6-11, are canceled, Claims 2, 3, 5, and 12 are amended, and Claims 13-16 are added. No new matter is included herein.

Claims 1 and 4 were rejected under 35 USC §103(a) as being unpatentable over Alston (US 4,647,975), in view of Ahn (US 5,768,442). Claims 2, 3, 7, and 8, were rejected under 35 USC §103(a) as being unpatentable over Alston, in view of Ahn, and in further view of Murata (US 5,325,182). Alston was used as the 35 USC §103(a) basis for rejecting all the other claims too.

Alston describes a basic camera that is admitted by the Office Action to lack teaching the use of a dual-slope digital translation table, so Ahn is cited for teaching I/O characteristic curves with dual slopes and a connecting knee-point.

Alston teaches something very different from the claimed present invention. A still camera is described in Alston in which two different exposures are used to obtain over-exposed and under-exposed images. These two exposures are stored in memory and used later so that a composite

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video can be stitched together electronically to form an image with a very wide dynamic range. An exposure controller gets these two different exposures by changing the exposure interval, gain, or aperture used between the two takes. Summary, Column 2, lines 36-67. The resulting effective dynamic range of the product exceeds that which can be obtained in a single frame of CCD video output in one exposure. Real-time applications for continuous video are therefore made impossible.

Ahn teaches a digital signal conversion method only. Analog signals are input, converted to digital, digitally processed, converted back to analog, and output. Fig. 3. Ahn applies itself to digital video signals that may have already been clipped, limited, or corrected. Selecting between different conversion I/O characteristics is disclosed. In particular, these different conversion I/O characteristics appear to have differing "knee-points", but the two gain slopes above and below the knees seem to be the same. Fig. 5. There is no teaching about using different ones of the curves on particular selected portions of a video frame. They appear in all cites to be semi-permanently selected and applied wholesale to sequential series of frames.

Embodiments of the present invention usually work with continuous video, frame-after-frame. Only some portion of

the image has a subject-of-interest. Specification, page 5, line 31, to page 6, line 16. So the frame can be electronically partitioned and the particular look-up table (LUT) that improves that portion of the overall scene is used. Other parts of the frame can be enhanced with other transfer functions resident in the LUT. The partitioning of a frame into segments and applying different gain profiles will produce an odd looking overall picture, but it is the subjects-of-interest that are being scrutinized. For example, in vehicle license recognition systems or manufacturing quality control automata, the backgrounds are unimportant. Specification page 6, lines 17-28.

Claims 1 and 11 recite, "for providing a digital conversion in which said linear dynamic range of the imaging device is fully preserved through to a digital video output". This was intended to make clear the full analog range of the CCD is needed to access the full digital range of the ADC so the best possible information was presented to the LUT. The amendments here are intended to claim such subject matter more clearly. The cited prior art describes analog amplifiers, limiters, and gamma correction devices in between the CCD and ADC that can corrupt and degrade the performance of the LUT.

Claims 2, 3, 5, and 12-16 differentiate over Alston, and the other cited prior art, in several substantial ways.

Claim 13 recites a matching of the light-exposure-to-analog conversion dynamic range characteristic of the imaging device to the analog-to-digital conversion dynamic range characteristic of the ADC. Such is supported in the Specification at page 3, lines 20-22. The transfer characteristic is linear. Alston teaches an analog signal conditioning circuit 22 in between these corresponding units that "provides video processing such as gamma correction, gain control for amplifying signals detected under various light levels, and light color balance." Column 3, lines 52-55. It is important in the claimed present invention for the ADC to get the maximum range of analog it can convert, and to receive that in its raw form so the LUT can work effectively. Specification page 1, lines 14-31, and page 4, lines 2-7.

Claim 13 further includes a look-up table (LUT) (116) connected to convert digital video output words of the ADC (112). Such critically includes a plurality of digital transfer functions. Specification page 3, lines 23-32. Alston teaches an LUT 28 and 36, and these bracket an arithmetic logic unit (ALU) 30. Fig. 1. But these two LUT's are operated in conjunction with the ALU to take two exposures with different gains and then add the results together. So the way the LUT's operate, and the goal being

sought, are quite different than that recited in Claims 13-16.

Claim 13 also includes a program controller (122) connected to the LUT (116) to select one of the different digital transfer functions to improve part of the image frame containing a subject-of-interest. For example, a license plate of a car. Specification, page 6, lines 6-16 and lines 25-28.

Claim 14 recites that the imaging device is a CCD. Specification page 3, lines 15-16. It further recites the plurality of digital transfer functions in the LUT each provide for a different dual-slope output conversion. Such is supported by Fig. 2.

Claim 15 recites the basic method embodied in Claim 13, and replaces what was intended to be recited in Claim 7.

Claim 16 recites "downloading and programming new ones of said plurality of digital transfer functions to be included in said LUT." Such is supported by the Specification at page 4, lines 8-23.
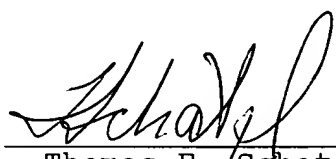
Accordingly, in view of the preceding amendments and remarks, it is respectfully submitted that the pending application, with pending Claims 2, 3, 5, and 12-16, is in condition for allowance and such action is respectfully requested.

Should the Examiner be of the opinion that a telephone conference with Applicant's attorney would expedite matters, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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